# NEW SPECIES OF PTERIIDAE, PINNIDAE, VENERIDAE, EUCIROIDAE AND CORBULIDAE FROM AUSTRALIA (MOLLUSCA: BIVALVIA: VENEROIDA).

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Seven new species of bivalves from Australia are figured and described: Pteria howensis sp. nov and P. cooki sp. nov. (Pteriidae); Atrina (Servatrina) palmensis sp. nov. (Pinnidae); Dosinia carpentariana sp. nov. (Veneridae); Euciroa queenslandica sp. nov. (Euciroidae); Corbula (Serracorbula) moretonensis sp.nov and C. (Anisocorbula) stephensoni sp. nov. (Corbulidae), All species are from Queensland except Pteria howensis, which is known only from Lord Howe Island. 

Mollusca, Bivalvia, Veneroida, Australia.

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During the preparation of the second volume of 'Bivalves of Australia' (Lamprell & Healy, in prep.) a number of apparently unnamed species were uncovered in the collections of the Australian Museum (Sydney), the Queensland Museum (Brisbane) and that of one of the authors (Lamprell Collection). These species include representatives of the following genera/subgenera and families: Pteria (Pteriidae), Atrina (Servatrina) (Pinnidae), Dosinia (Veneridae), Eucirou (Euciroidae) and Corbula (Anisocorbula and Notocorbula (Corbulidae). After searching the relevant literature, especially that pertaining to the Australian region (including Iredale, 1939; Lanıy, 1941; Hynd, 1954; Takemura & Okutanı, 1958; Rosewater, 1961; Fischer-Piette & Delmas, 1967; Healy & Lamprell, 1992; Lamprell & Whitehead, 1992; Lamprell & Stanisic, 1996; Poutiers & Bernard, 1995) and after comparisons with type specimens held in the Natural History Museum, London, the Museum national d'Histoire Naturelle, Paris and the Department of Malacology, Zoological Museum of the University of Amsterdam, we were satisfied that our species should be described as new.

#### MATERIAL AND METHODS

All measurements were made using vernier dial calipers. Shell height given is from the umbones to the ventral margin on the left valve vertical to the hinge line. Shell length given is the greatest distance from anterior to posterior margin. Shell depth given is the greatest distance between the surfaces of the left and right valves. Shell size given is for the largest specimen examined by the authors unless otherwise stated.

Abbreviations used: AMSC = Australian Museum, Sydney; KL = Lamprell Collection; QMMO = Queensland Museum, Brisbane; WAM = Western Australian Museum, Perth; lv = left valve; rv = right valve; pv = paired or conjoined valves; NSW = New South Wales; NT = Northern Territory; Qld = Queensland.

#### **SYSTEMATICS**

The systematic arrangement used for each family herein follows that of various authors (Cox & Hertlein, 1969; Hertlein & Cox, 1969; Keen, 1969a,b) in the Treatise on Invertebrate Paleontology with the exception of the Euciroidae which follows Poutiers & Bernard (1995) and the Pinnidae which follows Rosewater (1961).

#### Family PTERHDAE Gray, 1847

### Pteria Scopoli, 1777

TYPESPECIES. Mytilus Inrundo Linnaeus, 1758, SD-Kennard, Salisbury & Woodward, 1931.

Pteria howensis sp. nov. (Fig. 1A-H)

ETYMOLOGY. For Lord Howe Island.

DESCRIPTION. Shell length to 40.0mm; moderately solid, obliquely ovate, dorsal margin straight, umbones extend above the dorsal margin; both valves convex, left much more so and encompassing the right; a well-defined, rounded fold extends from the umbones to the posteroventral margin. Anterior wing short, moderately deep from the hinge line to the narrow byssal

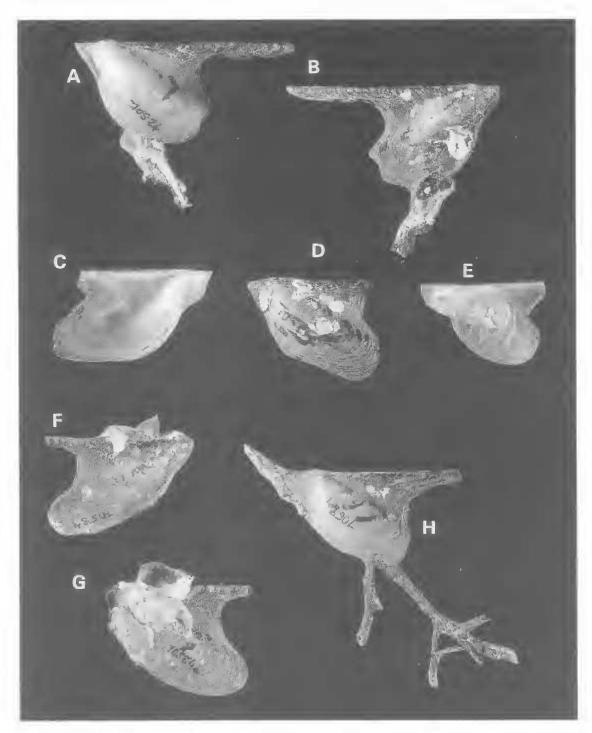


FIG. 1. *Pteria howensis* sp. nov. A-B, holotype; C-H, paratypes. A, external view of lv; B, external view of rv; C, internal view of lv; D, external view of lv; E, internal view rv; F, external view of rv; G, external view of lv; H, external view of lv.

notch; posterior wing narrow, varying from short to very long; anterior margin convex, posterior margin concave. Sculpture of concentric growth striae; periostracum of widely spaced, imbricated concentric lamellae. Colour externally light bronze with irregular, darker brown zigzag concentric patterns and concentric lines and an irregular black stripe on the umbonal fold; internally silvery nacreous, medially with a narrow pale brown margin.

MATERIAL EXAMINED. HOLOTYPE: AMSC-70584, Ipv, off Ball's Pyramid, Lord Howe I. 55m, McIntyre, 22.11.1960. Length 40.0mm, height 18.5mm, depth of conjoined valves 6.5mm, PARATYPES: AMSC203159, 5pv, 1lv, same data as nolotype. Length of largest paratype 27.8mm, height 19.6mm, depth of conjoined valves 7.8mm.

HABITAT AND DISTRIBUTION. Attached to soft corals in shallow water; known only from Lord Howe Island.

REMARKS. Pteria howensis sp. nov. is similar to P. peasei (Dunker, 1872), P. sibogae Prashad, 1932, P. loveni (Dunker, 1872) and P. cypsellus (Dunker, 1872) in outline, but does not attain the large size of these species. Additionally none of the latter species have the consistent bronze colour evident in P. howensis. P. penguin (Röding, 1798) and P. falcata (Lamarck, 1819), while similar in shape, are much heavier-shelled species than P. howensis and also attain a much larger size. P. howensis is similar in shape to juvenile specimens of P. penguin and P. falcata, but differs in colour. Both these species retain the same colour to adulthood. P. howensis in both juvenile and adult has a consistent light bronze background shell colour, (black in P. penguin and bone-green in P. falcata) with brown, irregular zigzag concentric patterns and irregular concentric lines over the surface and an irregular black stripe on the umbonal fold.

> Pteria cooki sp. nov. (Fig. 2A-D)

ETYMOLOGY. For Stephen Cook.

DESCRIPTION. Shell length to 52.5mm; fragile, translucent, elongate, obliquely ovate, dorsal margin straight, umbones extending above margin line; both valves convex, left much more than the right. Anterior wing more or less an extension of the dorsal margin with a strong oblique depression or fold separating it from the main body posterior wing moderately short with an almost

obsolete fold separating it from the main body of the shell. Sculpture of concentric microscopic striae; periostracum of widely spaced, narrow radial processes arranged in concentric rows, parallel to the shell lip. Colour externally off-white to pearl-white with a strong radial brown ray extending from the umbones to the posteroventral triangin, stronger on the ly, weaker and sometimes obsolete on the right, with a narrow brown stain extending the full length of the dorsal margin; internally nacreous medially with a wide transluscent white margin.

MATERIAL EXAMINED. HOLOTYPE: QMMO59356, Lpv, Shelburne Bay, north Qld, 11°27'S, 142°55'E, 18m, S. Cook, May 1992. Length 54.2mm, height 20.0mm, depth of conjoined valves 8.6mm.PARATYPES: AMSC203157, 3pv, WAM46.97. Ipv, same data as holotype; AMSC320793, Ipv, 11°13.2'S, 143°25.8'E, Shelburne Bay, north Qld, 22m, S. Cook, Apr 1993. Dimensions of paratypes: AMSC203157, length 52.5mm, height 23.5mm, depth of pv 9.5mm; WAM46.97, length 51.3mm, height 24.5mm, depth of pv 10.0mm, OTHER MATERIAL; KL, 3pv, same data as holotype; QMMO59357, 1pv, Arafura Sea, stn 511, attached to sea anemone, Bureau of Fisheries, K. Colgan, 1989; QMMO59358, 11pv, Arafura Sea, stn 524, attached to sea anemone, Bureau of Fisheries, K. Colgan, Nov 1989; QMMO59359, 1pv, Arafura Sea, stn 541, attached to sea anemone, Bureau of Fisheries, K. Colgan, Nov 1989; QMMO59360, 2pv, Arafura Sca. stn 505, attached to sea anemone, Bureau of Fisheries. K. Colgan, Nov 1989; QMMO59361, 1pv, Arafura Sea, stn 403, attached to sea anemone, Bureau of Fisheries, K. Colgan, Nov 1989; QMMO59362, 1pv, Arafura Sea, stn 531, attached to sea anemone, Bureau of Fisheries, K. Colgan, Nov 1989.

HABITAT AND DISTRIBUTION. Attached to sea anemones and soft corals to 22m; Pteria cooki appears restricted to north Qld and the Northern Territory, presently known from Shelburne Bay on the east coast of Cape York and the Arafura Sea.

REMARKS. P. cooki sp. nov. differs from P. levitata Iredale, 1939 principally in colour: P. cooki being pearly white with a dark brown zigzag pattern and oblique rays whereas P.levitata has a dark brown, heavily mottled shell with obscure oblique rays and with no trace of nacreous lustre. P. levitata is also more solid, attains a larger size and has more pronounced hinge teeth. P. cooki occurs sympatically with P. brevialata (Dunker, 1872) but can be distinguished from that species by having a lighter shell, weaker sculpture and shorter wings. The brown dotsal margin and ray, constant in P. cooki is absent in P. brevialata.

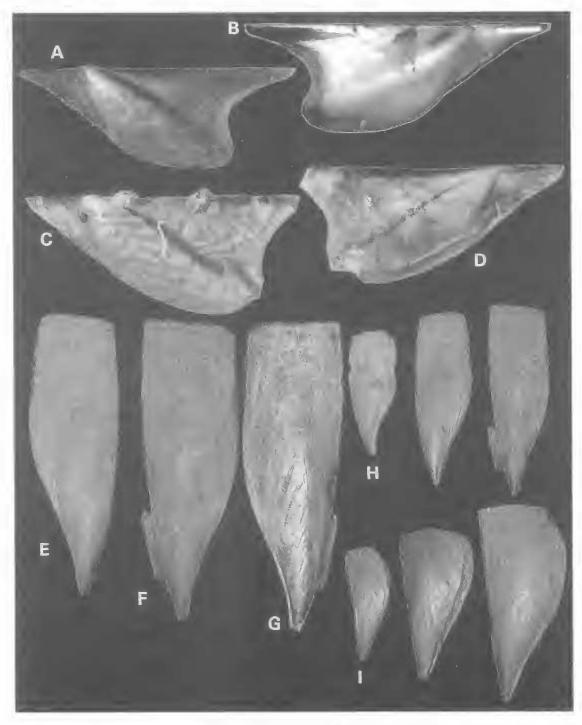


FIG. 2. A-D, *Pteria cooki* sp. nov. A-B, holotype; C-D, paratypes. A, external view of lv; B, internal view of lv; C, external view of lv; D, view of pv shown principally from rv aspect. E-G, *Atrina (S.) palmensis* sp. nov. E, external view of rv of holotype; F, external view of lv of paratype; G, internal view of lv of paratype; H, growth series *A. (S.) palmensis* (left to right; lv's paratype, holotype, paratype); l, *Atrina (S.) pectinata*: three juvenile specimens (dredged from same locality as *A. (S.) palmensis*).

## Family PINNIDAE Leach, 1819

## Atrina Gray, 1842

TYPE SPECIES. Atrina vexillian (Born, 1778); SM-Gray, 1847.

A. (Servatrina) Iredale, 1939.

TYPE SPECIES. Atrina assimilis (Reeve, 1858).

Atrina (Servatrina) palmensis sp. nov. (Fig. 2E-H)

ETYMOLOGY, For Palm Island.

DESCRIPTION. Shell to 51.6mm in height; thin, relatively small for family. Valves equivalve and inequilateral, profiles triangular anteriorly and quadrate posteriorly. Both valves well inflated in proportion to the shell size. Dorsal margin of each valve conspicuously convex; ventral margin straight posteriorly, concave anteriorly; posterior margin truncate, forming a right angle with the posteroventral margin; ligament extending approximately half the length along the dorsal edge from the umbones. Sculpture of well-defined, narrow ribs (10 ribs/cm measuring from the ventroposterior margin), curving strongly towards the ventral edge, ornamented with fine erect scales which are sparse on the dorsal surface, stronger and more numerous on the ventral surface and obsolete towards the umbones; internally ribs are impressed as deep grooves. Colour externally horn with purple-black umbonally; internally the nacreous surface covers the anterior half of the shell.

MATERIAL EXAMINED. HOLOTYPE: AMSC-203160, Ipv, between Palm and Curacoa Islands, north Qld, dredged, 9m, K. Lamprell & P. Spoor, Nov 1990. Height 47.5mm, width from dorsal to ventral margins 15.1mm, width of pv 8.9mm, PARATYPES: AMSC203161, Ipv, same data as holotype. Height 33.5mm, width from ventral to dorsal margins 12.6mm, width of pv 7.2mm; QMMO59355, Ilv, I broken rv, off Palm I, north Qld, dredged, K. Lamprell & P. Spoor, 1989, Height 51.6mm, width from dorsal to ventral margins 16.5mm, depth of lv 4.5mm.

HABITAT AND DISTRIBUTION. Dredged to 9m in sandy, weed-covered areas; between Palm and Curacoa Islands, north Qld.

REMARKS. Atrina (S.) palmensis sp. nov. appears to live shallowly anchored to a sandy, weed-covered bottom in the Palm-Curacoa Island passage. Freshly collected specimens occasionally showed traces of byssal threads (Lamprell

pers. ohs.), although these threads are not preserved in any of the specimens from the type series.

Juvenile as well as large specimens of A. (S.) pectinata were also dredged from the same locality sometimes occurring in the same dredge haul as specimens of A. (S.) palmensis. However even as very small juveniles, these two species can be readily separated on the basis of valve profile and external sculpture. Whereas A. (S.) pectinata exhibits marked variation in the number of ribs and degree of ornamentation (Fig. 1), A. (S.) palmensis is remarkably constant in its sculpture. Atrina (S.) palmensis compared with the holotype of A. (S.) penna (Reeve, 1858) held in the Natural History Museum, London (BMNH 1252.8.29.41.3) from the Indonesia-Philippines area, which exhibits a similar narrow valve profile, differs in the dorsal edge (hinge) and ribs being curved towards the posteroventral margin (not curved in A. (S.) penna) while the ribs in A. (S.) palmensis are densely ornamented with low scales, the ribs in A. (S.) penna have strong, raised scales medially to the dorsal edge and obsolete to the ventral edge.

Family VENERIDAE Rafinesque, 1815

Dosinia Scopoli, 1777

TYPE SPECIES. Venus concentrica Born, 1778; fide Fischer-Piette, 1942; M.

Dosinia carpentariana sp. nov. (Fig. 3A-E)

ETYMOLOGY. For the Gulf of Carpentaria.

DESCRIPTION. Shell length to 38.5mm; ovate, equivalve, moderately inflated, solid; umbones prosogyrate; lunule heart-shaped, raised centrally, strongly impressed peripherally, surrounded by the lamellate ends of the concentric. principal ribs continue on the lunule as lamellae; escutcheon long, narrow, defined by a raised, spinose ridge; ligament impressed; anterodorsal margin short, convex, sloping, widely rounded at the anterior margin; posterodorsal margin convex, sloping, becoming widely rounded at the posterior margin; ventral margin evenly and widely convex. Sculpture of numerous, strong, widely spaced, concentric ridges which become lamellose at the antero- and posterodorsal margins, interstices with 4-6 minor concentric ridges. Ligament long narrow, brown in colour. Hinge plate broad. Hinge of ly with anterior lateral tooth

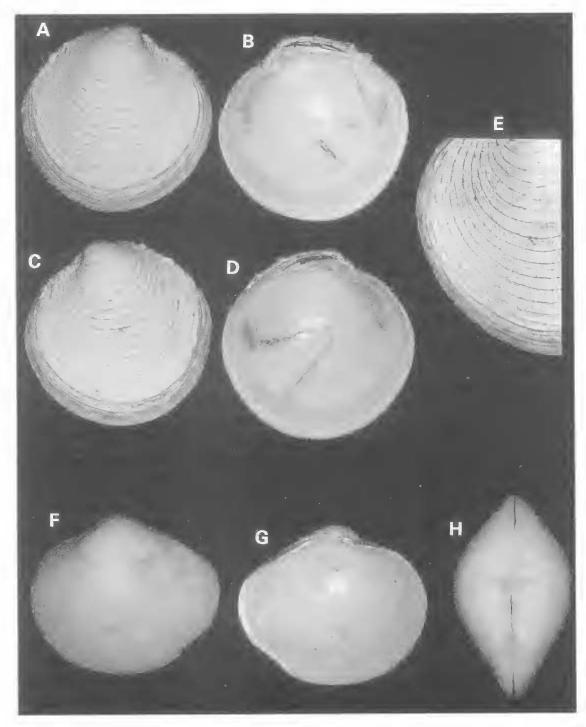


FIG. 3. A-E, *Dosinia carpentariana* sp. nov. A, B, external and internal views of rv of holotype; C, D, external and internal views of lv of holotype; E, detail of primary and secondary concentric growth ridges. F-H, *Euciroa queenslandica* sp. nov. F, G, external and internal views of lv of holotype; H, dorsal view of pv showing umbones, lunule and extent of valve inflation.

small, knob-like, bifid; anterior cardinal bladeshaped, raised, slightly oblique; median cardinal thin, posteriorly oblique; posterior cardinal thin, oblique, parallel to median cardinal. Hinge of rv with socket to accommodate anterior lateral of lv; anterior cardinal short, joined at apex with moderately solid, oblique, raised, median cardinal; posterior cardinal thin, raised, oblique. Muscle attachment scars well defined, anterior adductor scar narrow, clongate; posterior adductor scar tear-drop shaped. Pallial line fine. Pallial sinus deep, slightly angulate terminally, ascending, extending beyond shell median. Colour internally and externally chalk-white; periostracum grey.

MATERIAL EXAMINED. HOLOTYPE; QMMO-59363, 1pv, Gulf of Carpentaria, 10°30'S, 137°12.1'E, S. Cook, 50m, 19 Nov 1990. Length 27.0mm, height 26.4mm, width of pv 13.3mm. PARATYPES: AMSC107105, 3lv, Gulf of Carpentaria, 12°42.5'S, 141°31.7'E, 18m; AMSC123934, 1lv, 14°30'S, 141°20.5'E, NW of Edward River, Gulf of Carpentaria, Coll. J. Loch, 14.6m, 1976; AMSC304562, 1lv, NW of Edward River, Gulf of Carpentaria, 14°46'S, 141°20.7'E, 18m, I. Loch, 1976; AMSC107040, 24lv, 26rv, off Albert River mouth, Gulf of Carpentaria, 17°24'S, 139°47'E, D.F. McMichael & J.C. Yaldwyn, 1963; AMSC107014, 8lv, 10rv, off Albert River mouth, Gulf of Carpentaria, 17°24'S, 139°47'E, D.F. McMichael & J.C. Yaldwyn, 4-9m, 1963; AMSC123102, 1rv, W of Nassau River, E Gulf of Carpentaria, 15°51'S, 141°21'E, CSIRO, 7,3m. Dimensions of largest paratype (AMSC107105): Length 38.5mm, height 39.6mm, width 10.2mm.

HABITAT AND DISTRIBUTION. Trawled and dredged to 50m in sandy mud; known only from the Gulf of Carpentaria.

REMARKS. Dosinia carpentariana sp. nov. cannot be confused with any other known Indo-Paeific Dosinia because of its distinctive sculpture of numerous, strong, widely spaced, concentric ridges, whose interstices have 4-6 minor concentric ridges. Other species occuring in northern Australia are D. amphidesmoides (Reeve, 1850), D. histrio (Gmelin, 1790), D. sculpta (Hanley, 1845) D. amina Iredale, 1930, D. tumida (Gray, 1838), D. mira Smith, 1885, D. exasperata (Philippi, 1847), D. lochi Healy & Lamprell, 1992, D. queenslandica Healy & Lamprell, 1992 and D. laminata (Reeve, 1850), all of which have narrow, concentric interstices, without interstitial riblets: D. kaspiewi Fischer-Piette & Delmas. 1967 which has very fine concentric lirae with faint, central radial threads; D. altenai Fischer-Piette & Delmas, 1967, D. juvenilis (Gmelin, 1791). D. scalaris (Menke, 1843) and D. contusa (Reeve, 1850) which have wide concentric ridges and narrow interstices and *D. incisa* (Reeve, 1850) which has coarse, concentric ridges with obscure radial ridges medially.

## Family EUCIROIDAE Dall, 1895

#### Euciroa Dall, 1881

TYPE SPECIES. Verticordia eleganiissima Dall, 1881-M.

## Euciroa queenslandica sp. nov. (Fig. 3F-H)

ETYMOLOGY, For Queensland.

DESCRIPTION. Shell to 42.3mm in length; light weight but moderately solid; moderately inflated, equivalve, with an obscure, oblique ridge posteriorly, preceded by a shallow oblique flexure, slightly gaping posteriorly. Anterior margin short, almost straight, widely rounded terminally; posterior dorsal margin long, straight, sloping, posterior margin narrowly rounded; ventral margin well rounded, concave at the flexure. Sculpture of numerous, small, radial spinose ribs, strongest at the posterior third, less so at the anterior third and almost obsolete at the medial third, more noticable ventrally. Colour white, internally nacreous.

MATERIAL EXAMINED. HOLOTYPE: AMSC-120128, 1pv, NE of Lady Musgrave L, off central Qld, 23°38.8'S, 152°45.5'E, 365m, Globigerina mud and siliceous sponge, W.F. Ponder, I. Loch & P. Terrill, Dec 1977. Length 34.1mm, height 29.2mm, width 19.5mm, PARATYPES: AMSC321047, 2rv, same data as holotype. Length of largest rv 27.8mm, height 21.6, width rv 8.5mm; QMMO59367, 1pv, 11v, Capricom Channel, off central Qld, trawled, 128m. Length of pv, 42.3mm, height 35.3mm, width 24.8mm; length of lv, 38.1mm, height 32.0mm, width 11.7mm.

HABITAT AND DISTRIBUTION. Dredged in Globigerina mud and siliceous sand to 365m; central Old.

REMARKS. Euciroa queenslandica sp. nov. is similar in size to E. galatheae (Dell, 1956). However E. queenslandica differs in having sloped anterior and posterior dorsal margins (almost straight in E. galatheae) and being deeper in the posterior truncation, additionally it lacks the strong radial, medial sculpture of E. galatheae. E. queenslandica differs from Acreuciroa rostrata. Thiele & Jaeckel, 1931 in lacking the extended, narrowly attenuate posterior and the strong me-

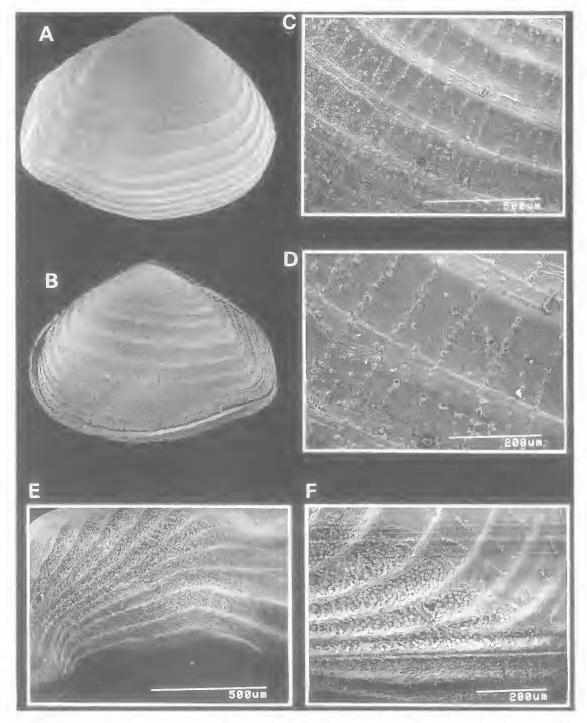


FIG. 4. A-F, *Corbula (A.) moretonensis* sp. nov. A, external view of rv; B, external view of lv; C, D, sculpture of rv showing radial pustules; E, F, sculpture showing concentric ridges and massed pustules of posterior margins.

dial radial sculpture of that species. E. queenslandica attains a far greater size than the Western Australian E. granifera (Cotton, 1931) and the Indo-Pacific (Northern Territory) E. crassa Thiele & Jaeckel, 1931, (42.3mm in E. queenslandica, 19.2mm in E. crassa and 6.8mm in E. granifera). E. queenslandica is more attenuate posteriorly than the Indo-Pacific E. eburnea Wood-Mason & Alcock, 1891 (roundly ovate in E. eburnea) while E. eburnea has denser radial sculpture. E. queenslandica lacks the transversely elongate shape of the large Indo-Pacific E. trapezia Poutiers, 1982 and has stronger radial sculpture posteriorly and ventrally.

Family CORBULIDAE Lamarck, 1818

Corbula Bruguière, 1797

TYPE SPECIES, Corbula sulcata Lamarck, 1801; SD-Schmidt, 1818

Corbula (Anisocorbula) Iredale, 1930

TYPE SPECIES. Corbula macgillivrayi Smith, 1885-OD

Corbula (Anisocorbula) moretonensis sp. nov. (Fig. 4A-F)

ETYMOLOGY. For Moreton Bay.

DESCRIPTION. Shell length to 3.0mm, minute, solid, moderately inflated, inequivalve; ry more inflated, encompassing the slightly smaller ly, widely truncate, with a well-defined fold extending from the umbone to the posteroventral margin. Anterior margin steeply sloping, narrowly rounded terminally; posterior dorsal margin moderately sloping, angulate; ventral margin convex, concave anterior to the posterior ridge. Sculpture of strong, well-spaced, rounded, concentric ridges and wider interstices crossed by radial rows of minute pustules on both valves. Colour white.

MATERIAL EXAMINED. HOLOTYPE: QMMO-59365, 1pv, off Middle Banks, Moreton Bay, southeast Qld, W. Stephenson, between Sept 1972-June 1974. Length 3.0mm, height 2.2mm, width 1.7mm. PARATYPES: AMSC203162, 19pv, same data as holotype; AMSC203159, 17pv, same data as holotype; AMSC203159, 17pv, same data as holotype; AMSC36301, many, Albany Passage, north Qld, 24m, C. Hedley.

HABITAT AND DISTRIBUTION, Dredged in sand to 10m; Moreton Bay, Qld.

REMARKS. Although Corbula (Anisocorbula) moretonensis sp. nav. is minute like C. (Notocorbula) monilis Hinds, 1843 and Corbula (Varicorbula) rotalis Hinds, 1843. It can be readily separated from these species in having well defined, narrowly rounded, concentric ridges and wider interstices crossed uniquely by radial pustules on both valves while the sculpture in C. (N.) monilis consists of widely rounded concentric ridges, stronger at the ventral margin and obsolete at the umbones and without regular radial lines. C. (V.) rotalis has widely rounded concentric ribs on the rv while the lv is almost devoid of concentric sculpture but has well-defined radial ridges, absent on the rv. In addition the rv in C. (A.) moretonensis just moderately encompasses the ly while in C. (N.) monilis the rv is much larger than the Iv, and in C. (V.) rotalis the lv is even smaller and more deeply encompassed. Very similar sculpture to that of C. (A.) moretonensis also occurs in C. (A.) macgillivrayi Smith, 1885 and C. (A.) taheitensis Lamarck, 1818, but these are much larger species (16-32mm) and more quadrate in shape than C. (A.) mortonensis.

Corbula (Notocorbula) Iredale, 1930

TYPE SPECIES. Notocorbula vicaria Iredale, 1930-OD

Corbula (Notocorbula) stephensoni sp. nov. (Fig. 5A-E)

ETYMOLOGY. For the late William Stephenson.

DESCRIPTION. Shell length to 2.0mm, minute, moderately solid; inflated, inequivalve; rv inflated, widely truncate posteriorly; encompassing the much smaller Iv. Anterior margin steeply sloping, widely rounded terminally; posterior dorsal margin long, moderately sloping; posterior margin angulate; ventral margin rounded, concave at the obscure ridge, umbones to posteroventral angle. Sculpture of rv medially with obscure concentric ridges, stronger ventrally with microscopic radial lirae; lv globose, smooth medially with obscure concentric striae stronger ventrally. Colour white.

MATERIAL EXAMINED. HOLOTYPE: QMMO-59366. 1pv, Cleveland Bay, north Qld, 19°15'S, 146°58'E, to 29m, Sept 1990. Length 2.0mm, height 1.54mm. PARATYPE: AMC203163, 1pv, same data as holotype.

HABITAT AND DISTRIBUTION. Dredged in sand to 29m; Cleveland Bay, north Qld.

REMARKS. Corbula (N.) stephensoni sp. nov. is similar to C. (N.) monilis Hinds, 1843, C. (V.)

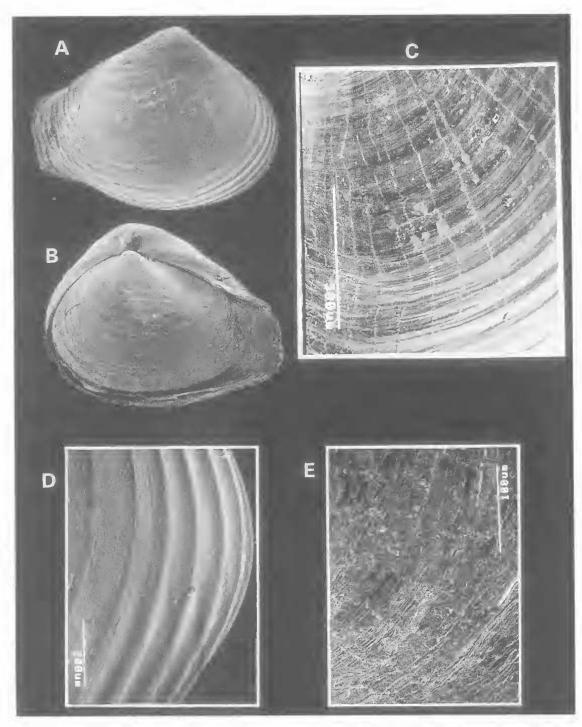


FIG. 5. A-E, *Corbula (N.) stephensoni* sp. nov. A, external view of rv; B, external view of lv; C, external view of rv sculpture; D, ventral sculpture in rv; E, posterior margin of lv showing detail of periostracal layers.

rotalis Hinds, 1843 and C. (A.) moretonensis in size. However C. (V.) rotalis and C. (A.) moretonensis have well-defined concentric sculpture with prominent interstitial radial lirae (both valves in C. (A.) moretonensis, lv in C. (V.) rotalis) while C. (N.) stephensoni has ventral concentric striae (obsolete medially) and microscopic radial lines on rv only, C. (N.) stephensoni is much more produced posteriorly than C. (V.) monilis and has a much narrower umbones (widely rounded in C. (V.) monilis).

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